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# The first record of *Pselaphochernes scorpioides* (Hermann, 1804) from Georgia, Caucasus (Arachnida: Pseudoscorpiones)

Mariam Gogshelidze<sup>1</sup>, János Novák<sup>2</sup>

<sup>1</sup> Institute of Zoology, Ilia State University, Tbilisi, 0162, Georgia

<sup>2</sup> Hungarian Natural History Museum Eötvös Loránd University, Faculty of Science, Institute of Biology, Budapest, Hungary

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Corresponding author: Mariam Gogshelidze (mariam.gogshelidze.1@iliauni.edu.ge)

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## Abstract

*Pselaphochernes scorpioides* (Hermann, 1804) is reported from Georgia for the first time. This is also the first record of the genus *Pselaphochernes* in Georgia. The finding is based on one female specimen found in the Malaise trap in Kintrishi National Park, Adjara Region. A description of the main morphological and morphometrical characteristics of the collected specimen is provided.

## Key words

Adjara, Chernetidae, Kintrishi National Park, Malaise trap, Western Georgia

## Introduction

Fifty-three species of pseudoscorpions have been reported from Georgia so far, belonging to six families (Chernetidae, Atemnidae, Cheliferidae, Neobisiidae, Withiidae, and Chthoniidae) (Zaragoza et al. 2021; WPC 2023; Turbanov and Kolesnikov 2023). The study of Georgian pseudoscorpions began with the work of Koch (1878) and Daday (1889) and continued throughout the 20<sup>th</sup> century with contributions from Beier (1940), Kobakhidze (1943, 1960–1966), and Schawaller (1983), Schawaller and Dashdamirov (1988), and Dashdamirov and Schawaller (1992). In recent years, Nassirkhani and Mumladze (2019a,b), Nassirkhani et al. (2019), Zaragoza et al. (2021), Kolesnikov et al. (2022), and Turbanov and Kolesnikov (2023) have continued to expand our understanding of these animals. From the family Chernetidae, nine species were previously reported from the country: *Allochernes microti* Beier, 1961; *A. widleri* (C.L. Koch, 1843); *Chernes cimicoides* (Fabricius, 1793); *C. hahnii* (C.L. Koch, 1839); *C. horvathii* Daday, 1889;

*Dendrochernes cyrneus* (L. Koch, 1873); *Dinocheirus panzeri* (C.L. Koch 1836); *Lamprochernes chyzeri* (Tömösváry, 1883); *L. nodosus* (Schrank 1803) (WPC 2023). In the present paper, we aim to add *Pselaphochernes scorpioides* (Hermann, 1804) to the Georgian Chernetidae list based on a newly collected female specimen (Fig. 1A) from Kintrishi National Park, Adjara Region. This species is widely distributed across Europe, North Africa, the Middle East, and Central Asia (WPC 2023). In the Caucasus, *P. scorpioides* was reported from Azerbaijan, Armenia, and Turkey (WPC 2023). Furthermore, a description and illustration of the main morphological characteristics of the collected Georgian specimen of *P. scorpioides* are provided.

## Material and methods

The female specimen of *Pselaphochernes scorpioides* was collected within the framework of the Caucasus Barcode of Life (CaBOL) project by the use of a malaise trap operated from

June 1 to June 15 of 2018 in a temperate deciduous forest in Kintrishi National Park (Adjara region, Georgia) (Fig. 1B).

The specimen underwent clearing in lactic acid and was examined as a temporary slide using stereo and light compound microscopes (Accu-Scope-Exc-350). Following the lactic acid treatment, the specimen was rinsed in distilled water and then preserved in 96% ethanol. The measurements were acquired through Capta Vision software, and drawings were created using Adobe Illustrator (2020) software. Species identification was based on key references, including Beier (1932 and 1963), Christophoryová et al. (2011), and Nassirkhani (2018). The specimen is currently housed at the Zoology Department of Ilia State University in Tbilisi, Georgia, with the inventory code ISUIZ-Pseud-243, where ISUZ represents Ilia State University, Institute of Zoology.

For expressing the setation of tergites, we use the following formula: xLxPxM, where L = lateral setae, P = posterior setae, and M = mediolateral setae. Abbreviations of chelal trichobothriotaxy: eb = external basal; esb = external sub-basal; est = external sub-terminal; et = external terminal; ib = internal basal; isb = internal sub-basal; ist = internal sub-terminal; it = internal terminal; t = terminal; st = sub-terminal; sb = sub-basal; b = basal.

## Results and discussion

### Family Chernetidae Menge, 1855

### Subfamily Lamprochernetinae Beier, 1932

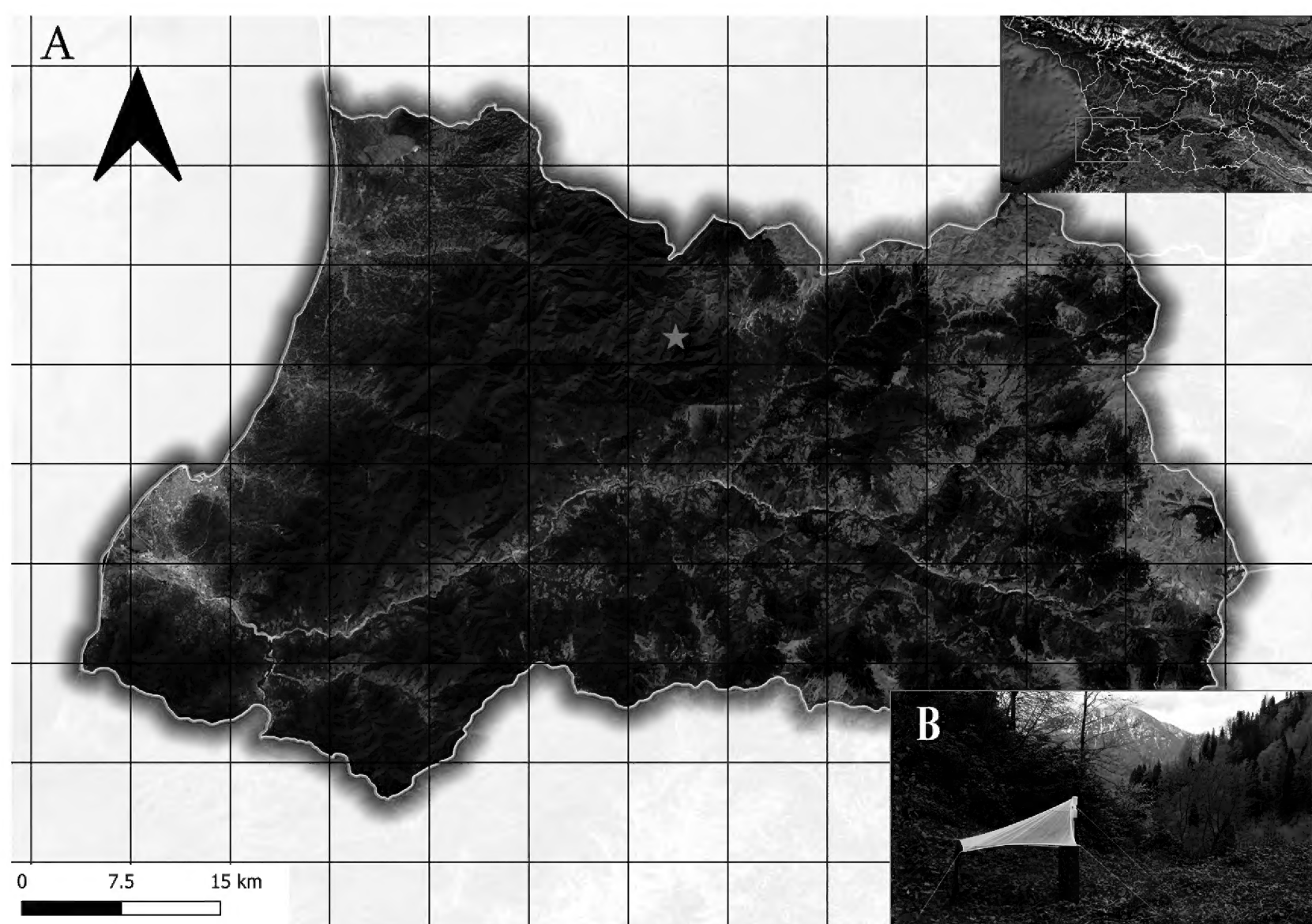
### Genus *Pselaphoernes* Beier, 1932

**Type species.** *Chelifer scorpioides* Hermann, 1804

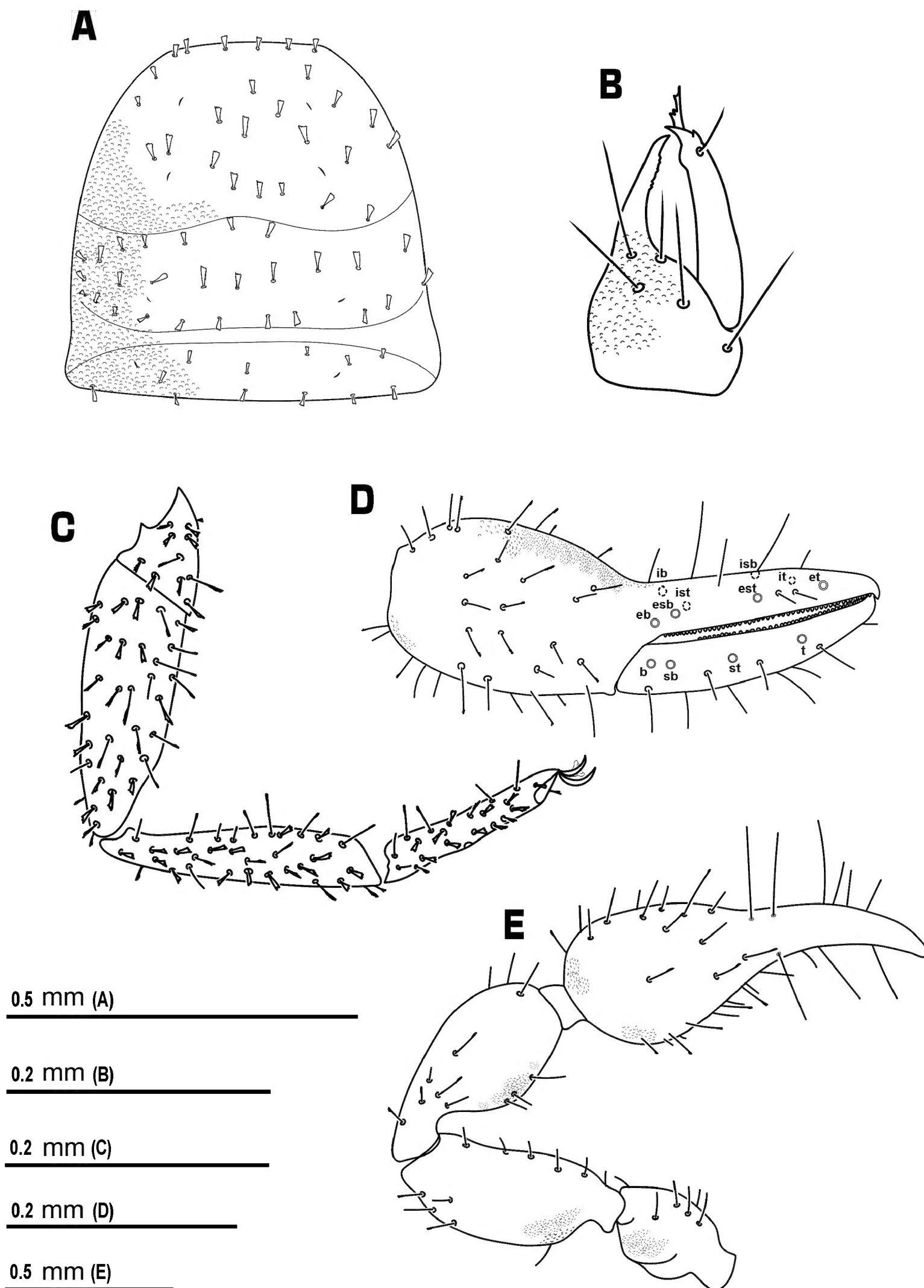
### *Pselaphoernes scorpioides* (Hermann, 1804)

**Material examined.** GEORGIA • 1♀ (ISUIZ-Pseud-243); western Georgia, Adjara region, Kintrishi National Park; 41°44'38.0"N, 42°05'02.0"E; 1264 m a.s.l.; Malaise trap; 1 Jun. – 15 Jun. 2018; leg. CaBOL team.

**A short description of the specimen.** Carapace (Fig. 2A): 1.07 times longer than broad; Surface granulated, with clavate setae; On the anterior margin 6, on the posterior margin 6 setae; Eyes or eyespots absent; Two trasverse furrows present 4 pairs of lyrifissures: 2 pair on anterior margin, 1 pair in posterior margin. Chelicera (Fig. 2B): Galea with 4 branches, 2 of them broken; Serrula exterior with 17 lamellae; Five setae on hand: *b*, *sb* and *es* dentate; Rallum with 3 blades; Coxal chaetotaxy: on pedipalpal coxa 16, coxa I with 13–14, coxa II: 18, coxa III: 21 and coxa IV: 26 setae. Pedipalps (Fig. 2E): Surface granulated, with clavate and long dentate setae on each segment; Femur 2.66 times, patella 1.97 times longer than broad; Fixed chelal finger with 45 and movable finger with 37 small cusped teeth (Fig. 2D); On the external side of chela, 7 accessory teeth on fixed and 2 on movable finger; On the internal side, fixed finger with 5 and movable finger with 2 accessory teeth. Abdomen: Tergal chaetotaxy I – XI: 1L5P1M : 1L5P1M : 1L5P0M : 1L6P1M : 1L6P1M : 1L6P1M : 1L5P1M : 1L5P1M : 1L3P1M : 1L2P1M : 8; Last tergite with two long tactile setae (one of them broken); Anal cone with 2 dorsal and 2 ventral setae; Sternal chaetotaxy IV–XI: 4:8:(?):12:12:18:18:12:8; Female genital atrium with a T-shaped spermatheca. Legs: One tactile seta at the middle of tarsus of leg IV (Fig. 2C) (broken, only its base is visible); Claws simple, arolium shorter than claws. Dimension (in mm): Body – 1.51; Carapace – 0.57/0.53 (1.07x); cheli-



**Figure 1.** A: Map showing the sampling area of *Pselaphoernes scorpioides* specimen. B: Habitat and the malaise trap situated at the sampling locality



**Figure 2.** *Pselaphochernes scorpioides*, female (ISUIZ-Pseud-243); **A:** Carapace, dorsal view; **B:** Chelicera, dorsal view; **C:** Leg IV, lateral view (The arrow is pointing at the location of the long tactile setae). **D:** Left chela, retrolateral view; **E:** Right pedipalp, dorsal view.

cera – 0.20/0.09 (2.37x); movable cheliceral finger – 0.13; Pedipalp: Femur – 0.50/0.21 (2.41x); patella – 0.46/0.23 (1.99x); chela – 0.94; chelal movable finger – 0.45; hand with pedicel – 0.47/0.31; hand without pedicel – 0.42. Leg I: femur – 0.13/0.07 (1.84x); patella – 0.19/0.7 (2.63x); tibia – 0.19/0.05 (3.61x); tarsus – 0.23/0.03 (7.23x); Leg IV: femur – 0.14/0.10 (1.37x); patella – 0.34/0.08 (4.20x); tibia – 0.36/0.06 (5.51x); tarsus – 0.27/0.05 (5.05x).

**Remarks.** Kintrishi National Park, the place of the new species record, is unique with its climate, plant and animal diversity. Here are presented Colchic relict forests with evergreen undergrowth (Dieterich 2018). Previously, five pseu-

doscorpion species were recorded from this area: *Neobisium crassifemoratum* (Beier, 1928); *N. fuscimanum* (C.L. Koch, 1843); *N. sylvaticum* (C.L. Koch, 1835); *N. labinskyi* Beier, 1937; and *N. validum* (L. Koch, 1873) (Kvavadze et al. 2008). Besides *Pselaphochernes*, four other chernetid genera are present in Georgia, namely, *Allochernes*, *Chernes*, *Dendrochernes*, and *Lamprochernes* (WPC 2023). The genus *Pselaphochernes* can be distinguished from all other chernetid genera based on the following combination of characters: having a T-shaped spermatheca; a rallum with 3 blades; the long tactile seta of pedal tarsus IV situated medially; and the posterolateral corner of coxa IV normal (Nassirkhani, 2018).



Though the characters of our specimen fit very well with other descriptions of *Pselaphochnes scorpioides* (Beier 1963; Nassirkhani 2018), we have found some slight differences that might be within intraspecific variation. Our specimen differed from the specimens described by Nassirkhani (2018) in having only 4 pairs of lyrifissures on the carapace, while the Iranian specimens did have 5 pairs. The new specimen differed from Beier's redescription (Beier 1963) in having 7 external accessory teeth on the fixed finger and 5 on the movable one (8 and 6 in Beier's redescription, respectively). Additionally, the new Georgian specimen has a lower femur length/width ratio (2.41x) compared to the descriptions of Beier (1963) and Nassirkhani (2018) (2.5–2.6x and 2.5–2.83x, respectively), but it is still within the range given by Christophoryová and Jablonski (2017) (2.27–2.95). In the Caucasus, the only other known species of the genus is *P. lacertosus* (L. Koch, 1873), which differs from *P. scorpioides* in having a shorter chelal finger than its chelal hand without pedicel (Beier 1932; Beier 1963). Based on the known area of the species, the occurrence of *P. lacertosus* (WPC 2023) in Georgia is also possible.

The preferred habitat type of the newly recorded species, *Pselaphochnes scorpioides*, is heaps with decomposing materials (Beier 1955, 1961, 1963, 1966; Ressler and Beier 1958; Ressler 1970). However, it was also collected from leaf litter, bird and ant nests, dead wood, tree hollows, decaying wood, under tree bark, and using malaise traps (Christophoryová 2010, 2013; Kaňuchová et al. 2016), therefore showing a diverse range of habitat preferences.

Phoresy on dipterans was observed in the case of *P. scorpioides* (Graham-Smith 1916; Weygoldt 1969; Muchmore 1971; Jones 1978; Cuthbertson 1982; Hetešová and Christophoryová 2022; Jurgová et al. 2019). This provides possible ways of trapping the specimen in the malaise trap, which is primarily used for collecting flying insects.

Our knowledge of the pseudoscorpion fauna of Georgia and other parts of the Caucasus is far from complete. With the new finding of *P. scorpioides*, the number of pseudoscorpion species known from the country has increased to 54. The genus *Pselaphochnes* is also new to the fauna of Georgia. The new finding clearly shows the need for further investigations of the Georgian pseudoscorpion fauna.

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